

**DNA MARKER FOR MARKER-ASSISTED SELECTION FOR SUNFLOWER  
RESISTANCE TO RACE G OF BROOMRAPE**

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**ABSTRACT**

For marker-assisted selection of sunflower for resistance to race G of broomrape, 2 new SCAR markers have been developed to identification the *HaOr7* gene. The marker RORS1 is for the presence/absence of the *HaOr7* gene with the length of the specific PCR product  $\approx$  168 bp and the SORS9 marker is for the presence/absence of the wild-type allele with the length  $\approx$  217 bp. Due to the possibility of multiplex PCR, these markers form a codominant marker system. This marker system was tested on 69 sunflower genotypes with different resistance to broomrape race G: 18 resistant and 34 susceptible lines of VNIIMK breeding, 3 resistant and 10 susceptible hybrids of VNIIMK breeding, 2 differential lines to race F of broomrape – LC1093 and P96 and 2 resistant commercial hybrids SI Chester (Syngenta, Switzerland) and P64LC108 (Pioneer Hi-Bred International, Inc., USA). All resistant sunflower lines to race G of broomrape showed the presence of only one specific PCR product of  $\approx$  168 bp in length (marker RORS1), characterizing them as homozygotes by the *HaOr7* gene. All susceptible lines, including two differential lines to race F as well as susceptible sunflower hybrids, showed the presence of a specific PCR product of only the SORS9 marker, a wild-type homozygote. Resistant hybrids, including SY Chester and P64LC108, were characterized by the presence of both fragments of the RORS1 and SORS9 markers, making them heterozygous. The marker was used to select sunflower plants from segregating populations at the Laboratory of genetics of VNIIMK. Phenotypic analysis, confirmed that all plants identified by the marker as susceptible were affected by broomrape, while resistant homo- and heterozygotes were not affected or were affected insignificantly – 1–3 tubercles per plant. Thus, the marker we developed is a good tool in sunflower breeding for resistance to race G of broomrape.

**Key words:** DNA marker, sunflower, *Helianthus annuus*, broomrape, *orobanche cumana*, marker-assisted selection